Space Weather Forecast

Issued on Thursday 27 March 2025 at 13:17 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Minor geomagnetic storms likely, decreasing chance of further Moderate geomagnetic storms day 1. Chance of Moderate flares (Minor-Moderate radio blackouts) throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity reached Moderate-class due to an isolated low level Moderate-flare from a small but slowly growing bipolar region in the northeast at 27/0037 UTC. There are currently five sunspot regions on the Earth-facing disc, all of which are small and magnetically simple. The region mentioned above is now the most significant of those clearly visible on the Earth facing disc. A new sunspot is developing with some magnetic complexity, also in the northeast.

No clear Earth-directed CMEs were observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind parameters were indicative of the arrival of a high speed stream (HSS) due to connection to a large coronal hole. Solar winds were initially at slightly elevated levels, with winds reaching strong during the evening of the 26th, then rising to very strong levels during the morning of the 27th. The Interplanetary Magnetic Field started at strong levels and has been on a gradual decline to current moderate levels. The north-south component initially fluctuated between strong positive (northward) and negative (southward) orientation. From around 26/1800 UTC the north-south component became mainly weak, slightly favouring a positive (northward) orientation. Geomagnetic activity was predominantly Active to minor geomagnetic storm levels, with two Moderate Storm intervals 26/1500-1800 UTC and 26/1800-2100 UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate solar activity is expected, with a chance of further isolated Moderate class flares, most probably from the sunspot region in the northeast of the solar disc.

Solar Wind / Geomagnetic Activity: No clear Earth-directed coronal mass ejections feature in the forecast, though an eruption on 25th may give a slight chance of a glancing blow on day 3 (29 Mar), although this carries low confidence.

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Solar winds starting the forecast period at strong to very strong levels on day 1 (27 Mar), due to the fast stream of solar wind from an unusually prominent coronal hole feature. Winds gradually waning towards slightly elevated levels on days 3 and 4 (29 and 30 Mar).

Active to Minor storm geomagnetic levels, with a chance of further Moderate storms at first on day 1 (27 Mar) due to coronal hole influences, before easing later day 3 into day 4 (29/30 Mar), becoming generally Quiet to Unsettled by the end of the period.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at background levels, with a slight chance of enhancement from any larger flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	90	70	30	10
Strong	G3	No	10	5	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	30	30	40	50
Very Active	R3-R5 (X Class)	No	1	1	1	5

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	1	1	1	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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